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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/686,110

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Winthrop D. Childers

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EXAMINER

LIANG, REGINA

ART UNIT

PAPER NUMBER

2629

MAIL DATE

DELIVERY MODE

07/31/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/686,110	Applicant(s) CHILDERS, WINTHROP D.	
	Examiner Regina Liang	Art Unit 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04 June 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-36, 40-61 and 68-70 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-36, 40-61 and 68-70 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                        |                                                                   |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>3/19/07</u> .                                                 | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. This Office Action is responsive to amendment filed 6/4/07. Claims 1-36, 40-61, 68-70 are pending in the application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

#### *Double Patenting*

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1-33 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-74 of U.S. Patent No. 7,086,736. Although the conflicting claims are not identical, they are not patentably distinct from each other.

The following is an example for comparing claim 1 of this applicant and claim 2 of P.N. ‘736.

Claim 1 of this application	Claim 2 of P.N. '736
A display system for displaying an image, comprising:  an image processing unit configured to process image data and generate a number of image sub-frames corresponding to said image data;	A display system for displaying an image comprising:  an image processing unit configured to process image data defining the image and generate said image sub-frames;
a modulator configured to modulate a light beam according to said image sub-frames;	a modulator configured to produce a light beam that sequentially bears a plurality of color image sub-frame, wherein each color image sub-frame corresponds to one color in a plurality of colors; wherein said modulator is configured to modulate said color light beam according to said number of color image sub-frames to produce said light beam bearing said plurality of color image sub-frames;
a scrolling color device configured to scroll a plurality of colors across a face of said modulator to produce a color light beam bearing said number of image sub-frames;	a sequential color device configured to shine a color light beam on a face of said modulator, said color light beam having a color that sequentially rotates through said plurality of colors,
display optics configured to display said image from said color light beam; and	display optics configured to display said light beam such that said plurality of color image

	sub-frames are successively displayed to form said image;
a wobbling device configured to displace said color light beam such that said image sub-frames are displayed with varying spatial offsets	a wobbling device configured to displace said light beam between display of each of said color image sub-frames such that a color image sub-frame corresponding to each color in said plurality of colors is displayed in each of a number of image sub-frame locations.

As can be seen above, claim 1 of this application and claim 2 of P. N. '736 are claiming the same subject matter, claim 1 of this application is broader version of claim 2 of P.N. '736.

5. Claims 34-36, 40-61, 68-70 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-74 of U.S. Patent No. 7,086,736 in view of Dewald et al (US 6,771,325, hereinafter Dewald).

Note the discussion of claim 1 above. Claim 1 of U.S. Patent No. 7,086,736 differs from claims 34, 40 and 68 of this application in that the color device is not configured to scroll the plurality of colors simultaneously across the spatial light modulator. However, Dewald teaches a sequential color display system (Fig. 2) having a scrolling color device (206, 208) configured to scroll a plurality of colors simultaneously across the spatial light modulator (210) during the generation of the light beam (e.g., see the abstract). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify claim 1 of U.S. Patent No.

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7,086,736 to have the scrolling color device as taught by Dewald so as to provide “an efficient illumination that is capable of providing the efficiency of a three-modulator display system while taking advantage of the simplified optics and low cost of a one-modulator display system” (col. 2, line 66 to col. 3, line 2 of Dewald).

6. Claims 1-33 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-31 of U.S. Patent No. 6,984,040. Although the conflicting claims are not identical, they are not patentably distinct from each other.

The following is an example for comparing claim 1 of this applicant and claim 26 of P.N. ‘040.

Claim 1 of this application	Claim 26 of P.N. ‘040
A display system for displaying an image, comprising: an image processing unit configured to process image data and generate a number of image sub-frames corresponding to said image data;	A display system comprising: an image processing unit configured to generate at least two data arrays during a projected frame period, each data array defining a sub-frame image to be displayed during an image sub-frame time period;
a modulator configured to modulate a light beam according to said image sub-frames;	a light modulator configured to receive light from the periodic light generator and to generate a modulated light beam during each image sub-frame time period;
a scrolling color device configured to scroll a	a periodic color light generator having a

plurality of colors across a face of said modulator to produce a color light beam bearing said number of image sub-frames;	varying color light period and configured to generate a sequence of primary colors during each of at least two of the image sub-frame time periods;
display optics configured to display said image from said color light beam; and	
a wobbling device configured to displace said color light beam such that said image sub-frames are displayed with varying spatial offsets	a wobbling device configured to receive the modulated light beam and provide relative displacement between the sub-frame images during the projected frame; a system timing unit configured to synchronize the wobbling device to the varying color light period to allow the projected frame period to be an integer multiple of the varying color light period.

As can be seen above, claim 1 of this application and claim 26 of P. N. '040 are claiming the same subject matter; claim 26 of P.N. '040 differs from claim 1 of this application in not having display optics, however, such limitation are obvious since the display image in claim 26 of P.N. '040 is a projected display image.

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7. Claims 34-36, 40-61, 68-70 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-31 of U.S. Patent No. 6,984,040 in view of Dewald et al (US 6,771,325, hereinafter Dewald).

Note the discussion of claim 1 above. Claim 26 of U.S. Patent No. '040 differs from claims 34, 40 and 68 of this application in that the color device is not configured to scroll the plurality of colors simultaneously across the spatial light modulator. However, Dewald teaches a sequential color display system (Fig. 2) having a scrolling color device (206, 208) configured to scroll a plurality of colors simultaneously across the spatial light modulator (210) during the generation of the light beam (e.g., see the abstract). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify claim 26 of U.S. Patent No. '040 to have the scrolling color device as taught by Dewald so as to provide "an efficient illumination that is capable of providing the efficiency of a three-modulator display system while taking advantage of the simplified optics and low cost of a one-modulator display system" (col. 2, line 66 to col. 3, line 2 of Dewald).

### ***Claim Rejections - 35 USC § 103***

8. Claims 1-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elliott et al (US 6,828,961 hereinafter Elliott) in view of Katoh et al (US 2003/0090597 hereinafter Katoh).

As to claims 1, 28, Fig. 2 of Elliott discloses a display system for display an image, comprising:

an image processing unit (controller 208) configured to process image data and generate a number of image sub-frames corresponding to the image data;



a modulator (spatial light modulator 206) configured to modulate a light beam according to the image sub-frames;

a scrolling color device (color wheel 204) configured to scroll a plurality of colors across a face of the modulator to produce a color light beam bearing the number of image sub-frames (col. 4, lines 17-27 for example);

display optics (projection lens 212) configured to display the image from the color light beam.

Elliott does not disclose a wobbling device configured to displace the color light beam. Katoh is cited to teach a projection type image display device similar to Elliott. Katoh teaches the display device comprising a wobbling device (image shifter 10 in Fig. 1, image shifter 106 in Fig. 37) configured to displace the color light beam such that the image sub-frames are displayed with varying spatial offset ([0195] for example). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display device of Elliott to have the wobbling device as taught by Katoh such that “the optical efficiency can be increased and a high-resolution color image can be displayed” (last two lines in [0508] of Katoh).

As to claims 2, 3, see Figs. 5 and 6 of Elliott.

As to claims 4 5, 31-33, Fig. 2 of Elliott teaches the controller 208 to control the synchronization between the color wheel 204 and the image data. Fig. 37 of Katoh teaches a system controller (132) to control the synchronization between the color signal selector (134) and the image shifter (106). Thus, Elliott as modified by Katoh teaches the system timing unit as claimed.

As to claims 6, 14, 19, Figs. 5 and 6 of Elliott teaches the scrolling color device as claimed.

As to claims 7-13, Katoh teaches the wobbling device (image shifter) is configured to displace the color light beam such that the second image sub-frame ( $n+1$  st frame) is displayed by an offset distance from a first image sub-frame ( $n$ th frame), wherein the offset distance comprising a vertical offset distance and a horizontal offset distance (see Figs. 12, 15, 18-21 for example).

As to claims 15-18, Figs. 60-62 of Katoh teaches the image subframe shifting pattern which is made up of six image subframes per period, which reads on a first to fourth image subframes and each is displayed by an offset distance as claimed.

As to claim 20, Fig. 37 of Katoh teaches a sub-frame generation function.

As to claims 21, Katoh teaches the modulator comprising a LCD array (8 in Fig. 1).

As to claims 22, Elliott teaches the modulator comprising a micromirror array (DMD).

As to claim 23, Katoh teaches the wobbling device (image shifter) comprising a galvanometer mirror (Figs. 16, 17).

As to claim 24, Katoh teaches a conventional scrolling color device comprising rotating prisms (last two line in [0015]).

As to claim 25, Elliott teaches the scrolling color device comprising a color wheel.

As to claims 26, Elliott teaches the plurality of color comprising R, G and B.

As to claims 27, Katoh teaches the plurality of color comprising R, Y, G, C and B (see Fig. 4).

As to claims 29, 30, it is inherent the modulator of Elliott having an array of controllable pixel elements.

9. Claims 34-36, 40-61, 68-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dewald in view of Katoh.

As to claims 34, 40, 68, Fig. 2 of Dewald discloses a display system for display an image, comprising:

an image processing unit (controller 216) configured to process image data and generate a number of image sub-frames corresponding to the image data;

a modulator (spatial light modulator 210) configured to modulate a light beam according to the image sub-frames;

a scrolling color device (206, 208) configured to scroll a plurality of colors across a face of the modulator to produce a color light beam bearing the number of image sub-frames (e.g., see the abstract in that “all three primary colors are produced simultaneously by the dynamic filter (206”);

display optics (lens 212) configured to display the image from the color light beam.

Dewald does not disclose a wobbling device configured to displace the color light beam. Katoh is cited to teach a projection type image display device similar to Dewald. Katoh teaches the display device comprising a wobbling device (image shifter 10 in Fig. 1, image shifter 106 in Fig. 37) configured to displace the color light beam such that the image sub-frames are displayed with varying spatial offset ([0195] for example). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display system of

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Dewald to have the wobbling device as taught by Katoh such that “the optical efficiency can be increased and a high-resolution color image can be displayed” (last two lines in [0508] of Katoh).

As to claims 35, 36, 43, 44, 70, Dewald teaches the controller 216 to control the synchronization between the color wheel (206) and the image data (col. 5, lines 41-43). Fig. 37 of Katoh teaches a system controller (132) to control the synchronization between the color signal selector (134) and the image shifter (106). Thus, Dewald as modified by Katoh teaches the system timing unit as claimed.

As to claims 41, 42, col. 7, lines 21-24 of Dewald teaches to scroll the plurality of colors across the face of modulator having a frame rate.

As to claims 45-51, Katoh teaches the wobbling device (image shifter) is configured to displace the color light beam such that the second image sub-frame ( $n+1$ st frame) is displayed by an offset distance from a first image sub-frame ( $n$ th frame), wherein the offset distance comprising a vertical offset distance and a horizontal offset distance (see Figs. 12, 15, 18-21 for example).

As to claims 52, 57, 69, Dewald teaches the scrolling color device having a plurality of sub-frames (col. 7, lines 20-24).

As to claims 53-56, Figs. 60-62 of Katoh teaches the image subframe shifting pattern which is made up of six image subframes per period, which reads on a first to fourth image subframes and each is displayed by an offset distance as claimed.

As to claims 58, 59, Dewald teaches the modulator comprises a LCD array or a DMD array (col. 11, lines 2-3).

As to claim 60, Dewald teaches the plurality of color comprising R, G and B.

As to claim 61, Katoh teaches the plurality of color comprising R, Y, G, C and B (see Fig. 4).

### ***Response to Arguments***

10. Applicant's arguments with respect to claims 1-36, 40-61, 68-70 have been considered but are moot in view of the new ground(s) of rejection.

In response to applicant's argument regarding claims 1 and 28 that the Elliott fails to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "all the primary colors being present on the modulator at the same time" or a band of each primary color is incident simultaneously on the modulator") are not recited in the rejected claims 1 and 28. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Elliott teaches the color wheel (scrolling color device) that sequentially applies each primary color, one at a time, to the light modulator, which reads on "a scrolling color device configured to scroll a plurality of colors across a face of said modulator to produce a color light beam bearing said number of image sub-frames" as claimed in claim 1 and "a scrolling color device configured to generate a scrolling color light beam comprising a plurality of colors" as claimed in claim 28.

Applicant's remarks regarding claims 34, 40 and 68 are not persuasive, see the rejection above.

Applicant's remarks regarding Double Patenting rejection are not persuasive since applicant is reading the limitation into the claims. Claim 25 of present application requires the

scrolling color device comprising a color wheel, claim 25 does not require "all the primary color are present on the modulator at the same time" as alleged by applicant. Claim 25 of U.S Patent No. 7,086,736 requires the sequential color device comprises a color wheel. Claim 28 of U.S Patent No 6,984,040 requires the periodic color light generator includes a color filter wheel. Therefore, "a scrolling color device" as claimed is equated with "a sequential color device" of U.S Patent No. 7,086,736, and "a scrolling color device" as claimed is equated with "a periodic color light generator" of U.S Patent No. 6,984,040. Therefore, the Office has demonstrated the claims of the present application are obvious in view of the claims in the applied patents and the Double Patenting rejections stand.

### *Conclusion*

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Regina Liang whose telephone number is (571) 272-7693. The examiner can normally be reached on Monday-Friday from 8AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Hjerpe, can be reached on (571) 272-7691. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Regina Liang  
Primary Examiner  
Art Unit 2674

7/24/07